Exhibit 1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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EXAMINER:	Shewaraged, Betelhem
APPLICANT:	Kasperchik, et. al
SERIAL NO.:	10/688,322
FILED:	10/16/2003
CONFRM. NO.:	8857
FOR:	PERMANENT FIXATION OF DYES TO SURFACE-MODIFIED INORGANIC PARTICULATE-COATED MEDIA
DOCKET NO.:	10015560-1

CERTIFICATE OF DEPOSIT UNDER 37 C.F.R. § 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail, postage prepaid, under 37 C.F.R. § 1.8 on the date indicated below and is addressed to Assistant Commissioner for Patents, Washington, D.C. 20231.

Brenda Wiseman
Name

1/26/06
Date of Deposit

DECLARATION OF VLADEK KASPERCHIK AND PALITHA WICKRAMANAYAKE UNDER 37 C.F.R. § 1.131

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I. We, Vladek Kasperchik and Palitha Wickramanayake, declare as follows:

1. We are named inventors in the above-captioned application and the subject matter described and claimed therein.

2. It is also our understanding that various claims in the above-recited patent application have been rejected under 35 U.S.C. 102(e) in view of the U.S. Patent No. 6,841,207 to Burch et al. (hereinafter "Burch"), filed on September 30, 2002.

3. The invention as described and claimed in the above-reference patent application was conceived and reduced to practice prior to September 30, 2002. Exhibit 2 is a redacted copy of three

pages of a lab notebook, which is hereby presented as evidence of this assertion. The redacted portions include lab notebook dates.

5. We declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful, false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful, false statement may jeopardize the validity of the application or any patent issuing thereon.

DATED this 24 day of January, 2006.

Vladek Kasperchik, Inventor of the Invention

Palitha Wickramanayake, Inventor of the Invention

Permanent Dye Fixation through Covalent Bonding with Inorganic Oxides of Ink-Receiving Layer in InkJet Media for Durable InkJet Prints.

Vladek P. Kasperchik, Palitha Wickramanayake

SUMMARY

Improved water/moisture durability of the inkjet print is achieved through formation of covalent bonds between dye-based colorants of the ink and surface-modified porous inorganic oxides of the ink-receiving layer of the inkjet media. The durable covalent bonding between the inkjet dye and surface of the inorganic oxide in inkjet media is realized through interaction of reactive group present in the dye structure and another reactive group present on the porous oxide surface. Examples of these reactive groups could be primary amine ($-NH_2$) or hydroxy- (-OH) groups present in the dye structure and aldehyde (-CHO), or epoxy groups immobilized on the modified inorganic oxides in inkjet media or vice versa

PROBLEMS SOLVED BY THE INVENTION

Relatively quick covalent bond formation between inkjet dye (from the ink) and porous inorganic oxides comprising ink-receiving layer of inkjet media would immobilize inkjet colorants within ink-receiving layer preventing its further migration. The colorant migration in the inkjet print, especially after being exposed to water or humid environment results in significant print/image quality degradation. Binding of the colorants through covalent bond formation would result in significant improvement of humidity-fastness and water-fastness of the inkjet prints.

PRIOR SOLUTIONS AND THEIR DISADVANTAGES

One of the methods of binding dyes in the inkjet media widely used before is usage of the charged species of the opposite sign in the inkjet media. In most of the cases polymeric cationic species (usually quaternary amines) are used as a mordants in inkjet media immobilization of anionic dyes present in the ink. Coulombic interaction between positively charged mordant and negatively charged anionic dye keeps the colorant in place. Major deficiency of this approach is that another competing anionic species may displace dye anions through ion exchange from mordant sites thus resulting in the colorant migration, i.e. ink bleeding, etc.

DESCRIPTION OF THE CONSTRUCTION AND OPERATION OF THE INVENTION (AN EXAMPLE)

In many cases ink-receiving layer of the inkjet media contains significant amounts of the porous inorganic oxides or hydroxides. Examples of the inorganic oxides widely used inkjet media are:

a) silica (SiO_2);
b) alumina (Al_2O_3);
c) boehmite (AlO(OH)).

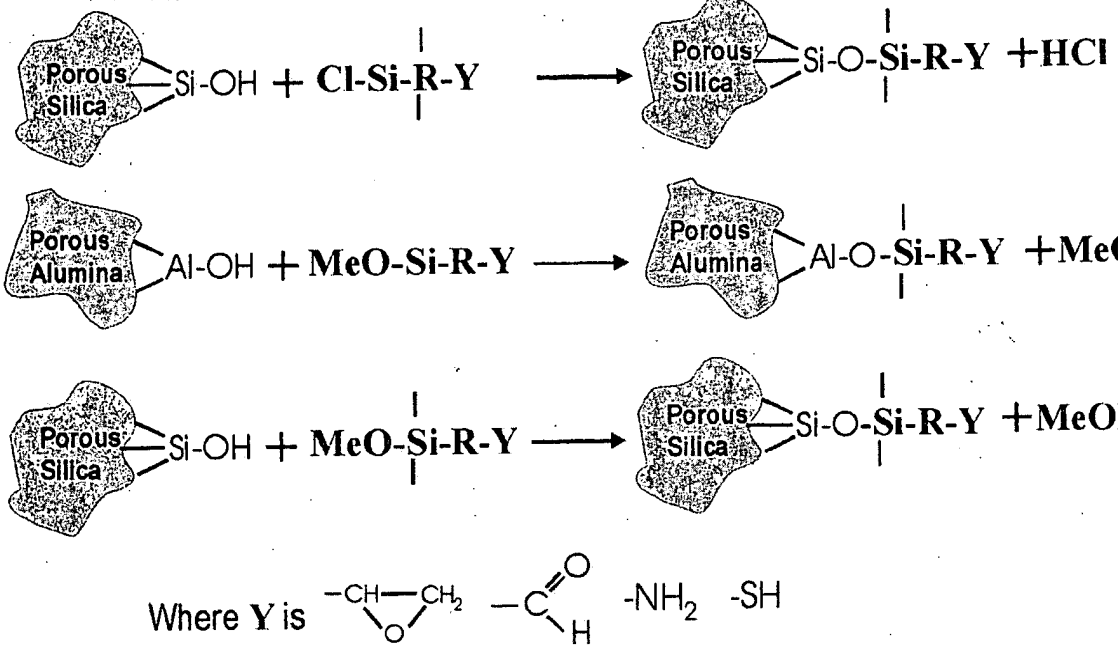
Surface of this inorganic oxides usually contains significant amounts of -OH groups. For this reason it can be relatively easy modified through the attachment of organic species containing reactive groups, for example through treatment with functionalized silanes:

Witnessed & Understood by me, Date

Invented by Vladek P. Kasperchik Date

Recorded by Vladek P. Kasperchik

From I



Where Y is -NH_2 -SH

Porous inorganic oxides with functionalized as described above surface can be incorporated (or made) into ink receiving layer of inkjet media. In turn, inkjet dyes with properly functionalized structure can interact with finctionalized oxide surface in the media and form stable covalent bonds immobilizing due molecules with ink-receiving layer.

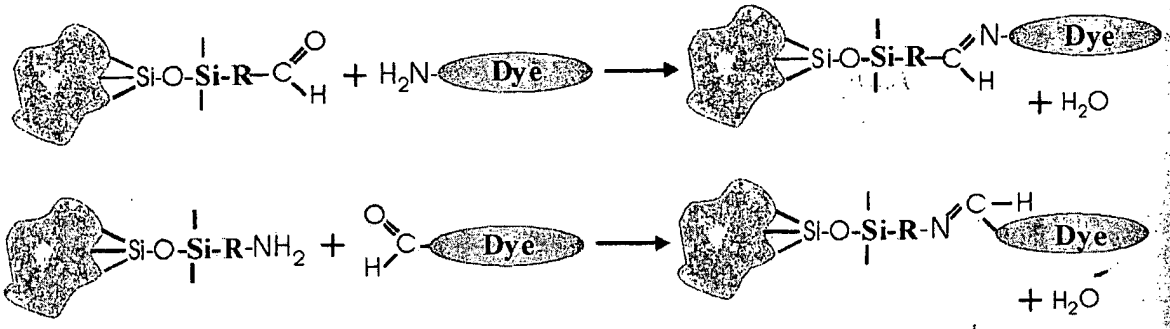
Major requirements for the functional reactive group in the inkjet dye are:

a) The functional reactive groups should be present in the non-specific part of the dye structure. Interaction of the reactive group of the dye with its counterpart (functional group) in the ink receiving layer should not result in significant change of the dye color.

b) Kinetics of interaction between functional groups of the dye and media should be fast enough to provide efficient dye binding in the media.

Below are presented are the examples of covalent bond forming interactions which can be used for permanent immobilization of inkjet dyes within porous ink-receiving layer of the media:

a) interaction between primary amino group (-NH_2) and aldehide (-CHO)or keto group (Schiff base formation:



Witnessed & Understood by me, Date

Invented by Vladek P. Kasperchik Date

Recorded by Vladek P. Kasperchik

b) interaction between epoxy group and primary amino ($-NH_2$) or thiol (-SH) group: